Overview of Wabtec Activities

National Transportation Board
Positive Train Control Forum

February 27, 2013

Wabtec
RAILWAY ELECTRONICS

ETMS® Overview

☐ Wabtec's Electronic Train Management Family Of Products Include:

- ■ ETMS® - Electronic Train Management System
- ■ CBTC - Communications Based Train Control
- ■ I-ETMS® - Interoperable Electronic Train Management System

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ETMS® Segments

Office Segment
- Train Data
- Authorities
- Restrictions

Communications Segment
- RF Base Stations
  - 802.11
  - Cellular
  - Satellite

Wayside Segment
- Signal Status
- Switch Status
- Radio Frequency Communication

Locomotive Segment
- Onboard Computer & Display
- GPS
- RF Communication

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Wabtec Segment Partcipation

- ☐ Locomotive Segment
    - ■ On-Board Computer & Display
    - ■ GPS
    - ■ Fabrication and Locomotive Connectivity
- ☐ Office Segment
    - ■ Back Office Server (BOS)
    - ■ TMDS™ Dispatch Systems
- ☐ Wayside Segment
    - ■ Wayside Interface Unit Design & Installation

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Product Overview

☐ Train Management Computer

  ■ Accepts & Validates Operating Data from Peripheral Devices, Office Segment and Wayside Segment

  ■ Determines Train Location, Speed

  ■ Enforces Authorized Train Movement

☐ Cab Display Unit

  ■ Human Interface to I-ETMS Functions

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Product Overview

- ☐ Crash Hardened Onboard PTC Recorder
  - ■ Records PTC and Event Recorder Data

- ☐ TMDS Train Management Dispatch
  - ■ Dispatcher Control of Train Movements
  - ■ Dispatcher Interface to Wayside Signal Equipment
  - ■ Convey Mandatory Directives and Train Sheet Data to Back Office Server

- ☐ PTC Back Office Server
  - ■ Transmits Authority, Bulletin And Train Consist Messages Generated by a Train Dispatching System to Locomotives
  - ■ Transmits Locomotive Status and Events to a Train Dispatching System
  - ■ Maintains Locomotive Software Configuration

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Wabtec Services Support

- ☐ Installation, Training and Support
  - ■ Technical Support or Turn Key Installation
  - ■ Installation Training Services
- ☐ PTC Track Data Generation
  - ■ Complete Generation and Verification Services
  - ■ Generation and Verification Tools support
- ☐ Wayside Signal and Communication Design Services
- ☐ Systems Integration Program Administration
- ☐ Regulatory Support

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ETMS® VII Development Status

- ☐ Approved for Revenue Demonstration Service

- ☐ Standard Wabtec On-Board Hardware

- ☐ Railroad-developed BOS

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I-ETMS® Development Status

- ☐ On-Board Software Version 6.3.8
  - ■ Released with Integration Testing Underway
- ☐ Back Office Server (BOS) Software Version 3.2.1 Currently Scheduled for Release July, 2013
- ☐ On-board and BOS Software Releases Currently Scheduled to be Available Late Summer 2013 for
  - ■ System Verification Testing
  - ■ Revenue Service Demonstration
  - ■ Initial System Deployment
- ☐ Predefined Changes to Be Rolled in Upon Completion of Definition, Development and Verification
  - ■ BOS Administration Enhancements
  - ■ Independent Check of Mandatory Directives

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Wabtec Product Supply

□ Locomotive Segment

- Through the End of 2012, Wabtec Estimates That 28% of Railroad Identified Equipment Has Been Delivered

- Wabtec Has Capacity In Place Today to Provide the Railroads Anticipated Deliveries in 2013, 2014 and 2015 Required to Satisfy RSIA Objectives

- Wabtec Has the Ability to Add Capacity if Requested By The Railroads

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